

Natural Riparian Resources

Water



Landscape & Soil



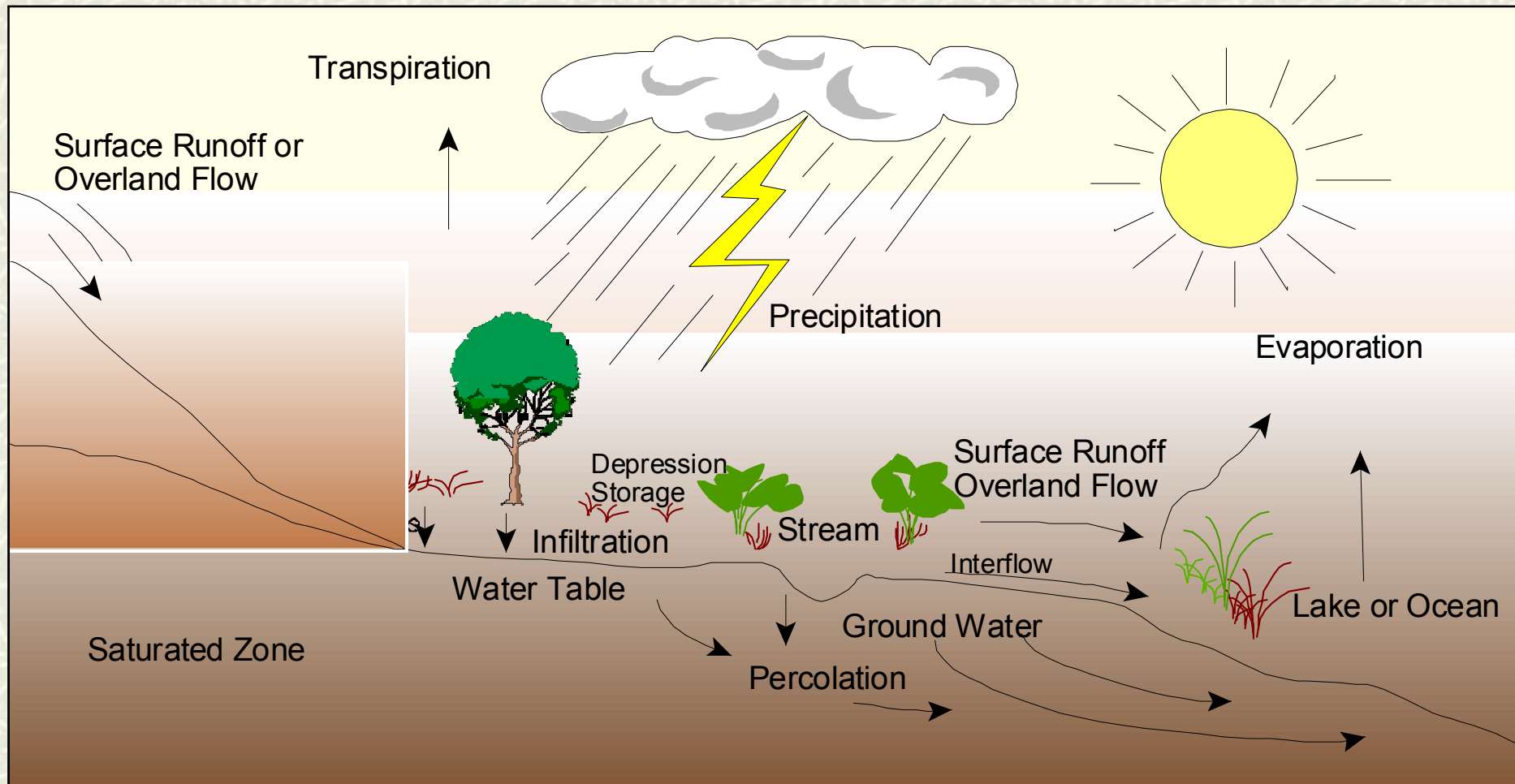
Vegetation

Water

Part of all physical and biological processes

- **Weathering process**
 - **Energy**
 - **Material**
 - **Transport**
 - **Deposition**
 - **Essential for all plants and animals**
-

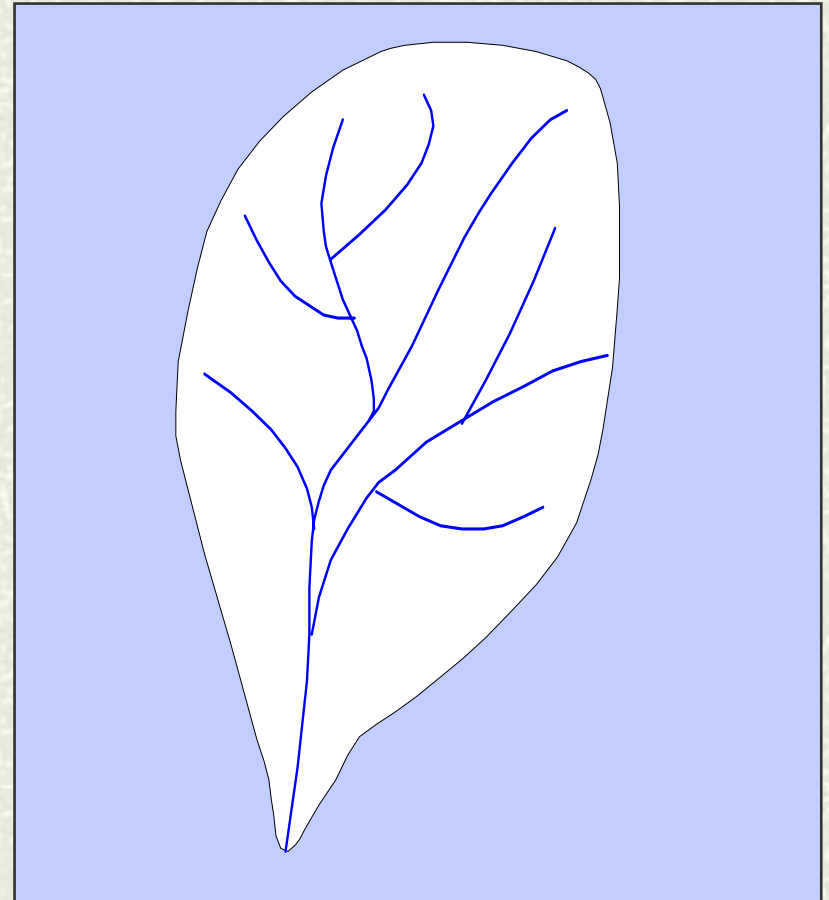
Hydrologic Cycle



Watershed or Catchment

Geographic Area

- Catches precipitation
- Drains water
- Has a single outlet or stream



Fixed Watershed Variables

Area

Shape

Orientation

Slope

Geology

**Drainage
Pattern**

Elevation

Climate

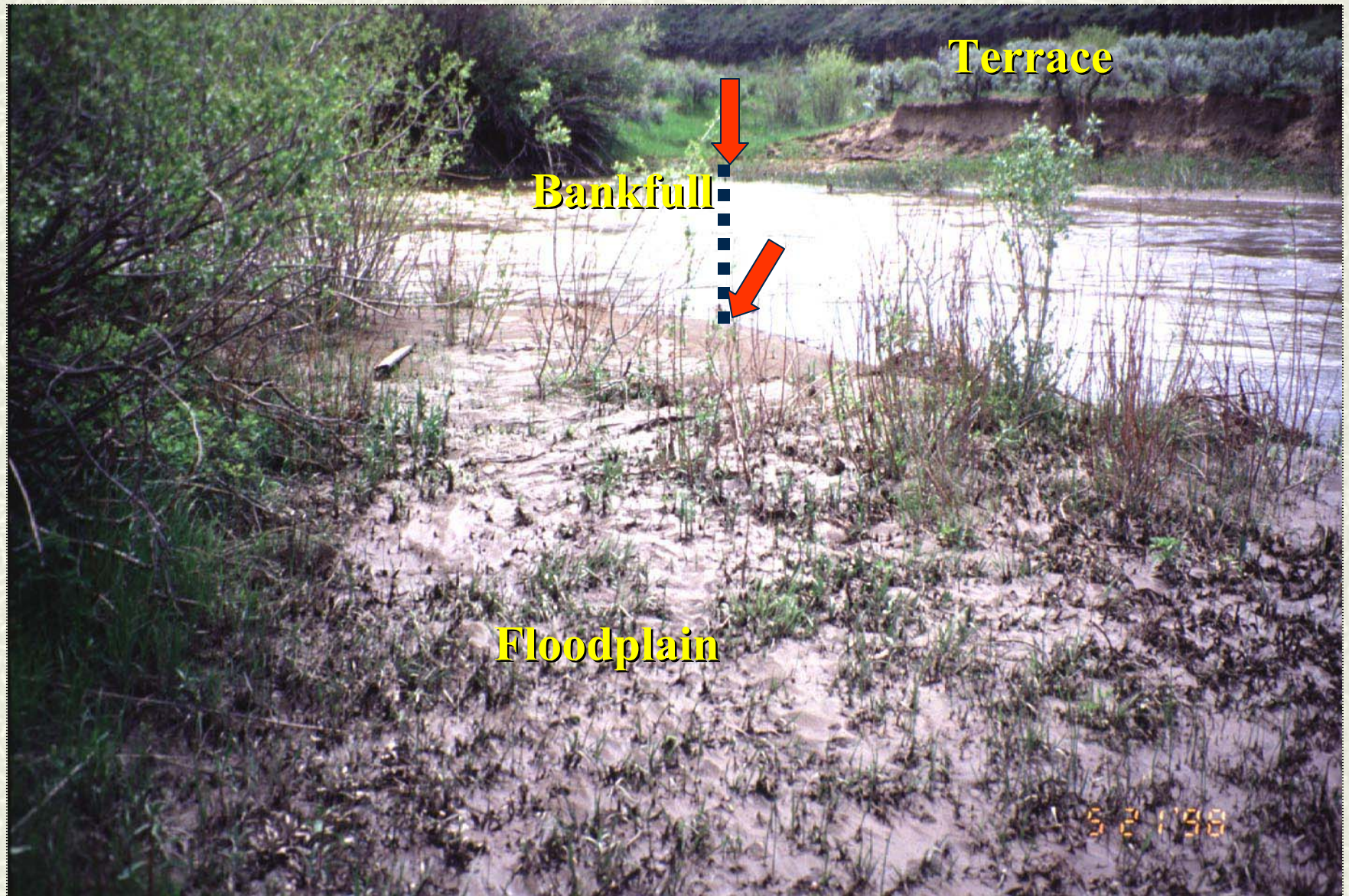
Management Influenced Watershed Variables

- # **Impervious Area**
 - # **Soils**
 - # **Drainage Density**
 - # **Vegetation**
 - # **Channel Features**
-

Standard Checklist (lotic)

Yes	No	N/A	HYDROLOGY
			1) Floodplain above bankfull is inundated in “relatively frequent” events
Rationale:			
			2) Where beaver dams are present they are active and stable
rationale:			
			3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region)
Rationale:			
			4) Riparian-wetland area is widening or has achieved potential extent
Rationale			
			5) Upland watershed is not contributing to riparian-wetland degradation
Rationale:			

1) Floodplain above bankfull is inundated in “relatively frequent” events





- # Discharge at bankfull stage creates & maintains channels
 - Moves sediment
 - Forms or removes bars
 - Forms or changes bends and meanders
 - Results in the average geomorphologic channel characteristics
 - Recurs every 1 to 2 years



Bankfull Indicators

- Deposition Features

- Top of point bars

- Change in Vegetation

- Especially lower limit of continual line of perennial species, at least 1 ft.



#Bankfull Indicators

#Change in particle size of bank material

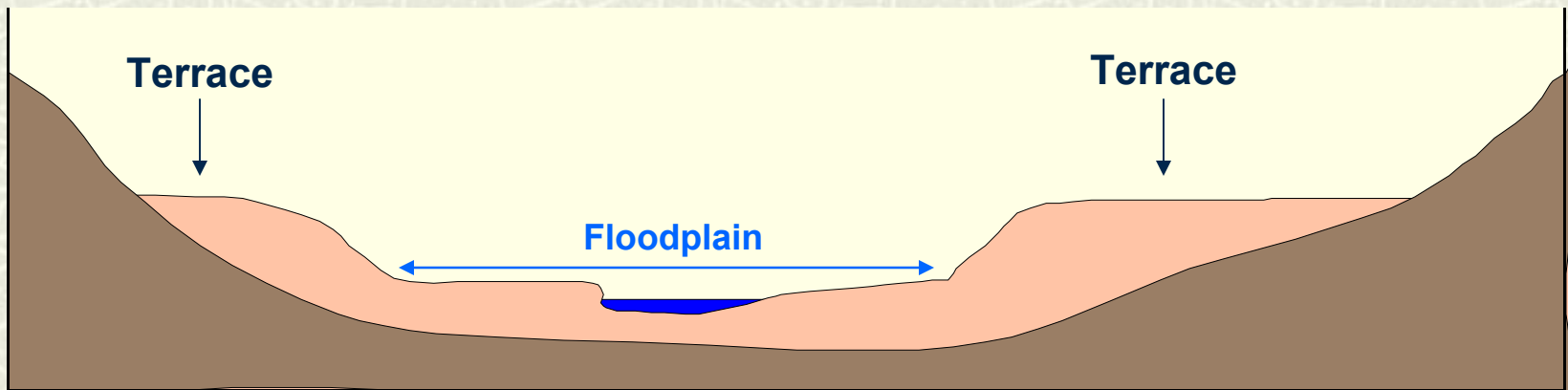
- Boundary between cobble/boulder and fine grained sand or silt

#Undercut banks

- Usually slightly below bankfull stage

#Stain lines or lower extent of lichens on boulders (Usually in large rivers)

Floodplain



- # Level area near a stream channel
- # Constructed by the stream
- # In the present climate
- # Flooded during moderate events
- # Should not be confused with “terraces” (abandoned floodplains)

1994 Leopold



- # Should this stream type have a floodplain?
- # How wide should it be?
- # How wide is it?
- # Is the stream channel incised or over sized?
- # Has widening begun?
- # Are most terrace walls sloped indicating widening has stopped?
- # Is there an up stream reservoir?



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2002



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2) Where beaver dams are present, they are active and stable

- # Beaver **must be present** or the dam is causing hydrologic effects
- # Sufficient building materials must be present
- # Sufficient food supply must be present
- # Usually a single dam is subject to high storm events



- # Are beaver dams currently acting as hydrologic modifiers?
- # Are beaver present?
- # Are beaver actively maintaining the dam?
- # Is there sufficient food to support the beaver?
- # Is the dam self-sustaining, e.g., significant vegetation is rooted in the dam?
- # Is the beaver dam a single large dam?
- # Are the beaver dams in a complex?



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1992



1995



3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region)

Question has three parts

- Sinuosity
- Width/Depth ratio
- Gradient

All three must be “yes” for the answer to be “yes”

Must be appropriate for the site



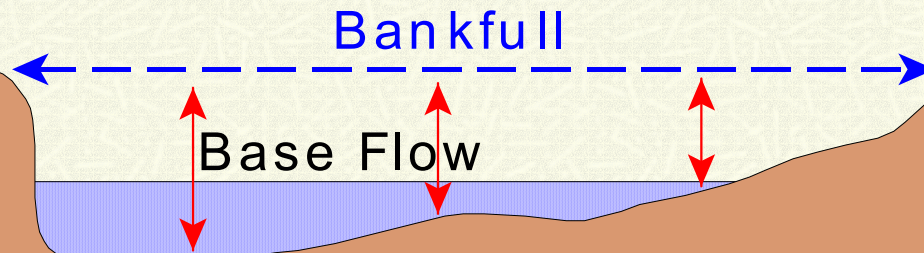
- # Is the stream actively eroding and building point bars?
- # Are there indications of channel straightening?
- # Does the sinuosity appear to be appropriate for the valley bottom type?

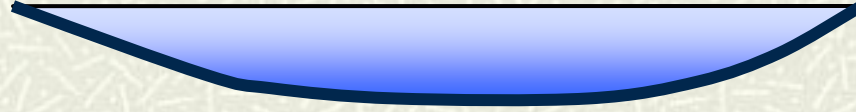


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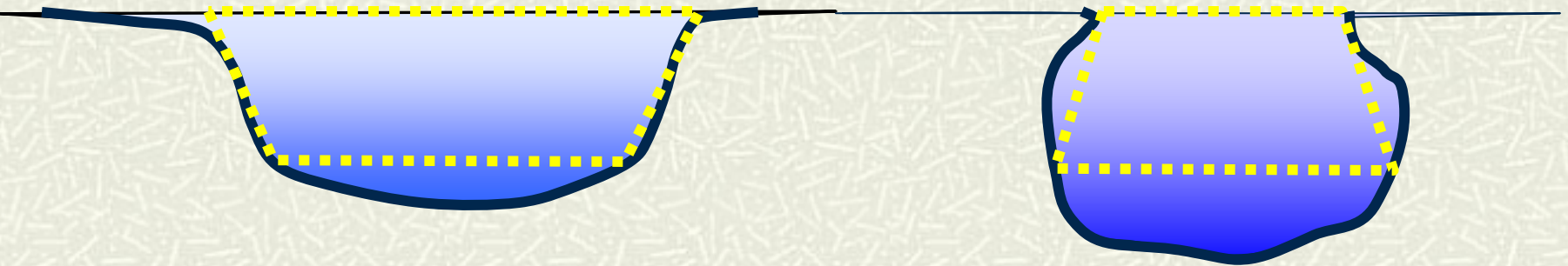
Width/Depth Ratio

Bankfull Width / Average Bankfull Depth





“most streams cross-section are not parabolic or semicircular (dish-shaped) in shape along the straighter reaches” Leopold 1994



“Rather, they are usually trapezoidal in shape with distinctly developed streambanks” Leopold 1994



7/20/99



Overwidened bankfull indicators

- Bank slumping and shearing
- Woody species growing within the channel
- Dish-shaped banks



Width/Depth Ratio

- Is the stream channel dish-shaped?
- Are the streambanks barren or dominated by increaser or colonizing species?
- Are streambanks undercut and/or slumping?
- Are the streambanks jagged (like a saw blade)?
- Is the floodplain the appropriate size (see question 1)?



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4) Riparian-wetland area is widening or has achieved potential extent

Question has two parts

- Is riparian/wetland area widening?
 - As the water table raises, riparian/wetland area can expand outward
 - As a stream channel narrows, the riparian/wetland areas expands toward the center of the channel
- Or, Has it reached potential extent?
 - Stream in a stable condition



- ⌘ Does the stream have the potential or capability to make a riparian area?
- ⌘ Are riparian species present only because their established roots still reach the water table?
- ⌘ Are riparian/wetland species regenerating?
- ⌘ Are upland species invading the riparian area?



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- # Is the channel narrowing?
- # Are point bars increasing in size?
- # Is the floodplain fully developed?
- # Is upland vegetation such as sagebrush dying?
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5) Upland watershed is not contributing to riparian degradation

Is there riparian/wetland or water quality degradation coming from the uplands

- Watch wording carefully

- Not contributing “Yes”

- Contributing “No”



- ⌘ Are there major changes in the watershed above this point such as logging, mining, agriculture, high road density, or vegetative manipulation?
- ⌘ Is there sufficient precipitation to cause increase flow as a result of these changes?



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- # Is there evidence of channel degradation because of increased flow from the watershed?
- # Is there evidence of sediment from the upland degrading the riparian area?



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Vegetation
